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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/629,650

07/30/2003

Tsutomu Kadotani

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23373

7590

12/29/2005

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

WANG, GEORGE Y

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 12/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/629,650	Applicant(s) KADOTANI, TSUTOMU	
	Examiner George Y. Wang	Art Unit 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 5-21 is/are pending in the application.
- 4a) Of the above claim(s) 11-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5-10 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/28/05, 11/29/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 12, 2005 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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3. Claims 1, 5, 10, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kijima et al. (U.S. Patent No. 6,259,500, hereinafter "Kijima") in view of Murade et al. (U.S. Patent No. 6,433,841, hereinafter "Murade").

4. Regarding claims 1 and 10, Kijima discloses an LCD device (fig. 8a, 8b, ref. 200) comprising a first substrate (fig. 8b, ref. 11 of 80), a second substrate (fig. 8b, ref. 11 of 60), a sealing member (fig. 8b, ref. 36) to form a gap between the first and second substrates, a liquid crystal (LC) layer (col. 13, lines 33-36) formed in the gap and confined by the sealing member (fig. 8b, ref. 36), and spacers (fig. 8b, ref. 34) arranged in the liquid crystal layer within a display region (fig. 8b, ref. 38) and none of the spacers are located in the non-display region (fig. 8b, ref. 37).

However, the reference fails to specifically disclose a depression formed on an inner surface of the first or second substrate such that the depression is located in the second part of the LC layer and the depression forms a step between the display region and non-display region and constitutes a buffer space for receiving extra liquid crystal.

Murade discloses an LCD device (fig. 3) comprising a depression formed on an inner surface of the first or second substrate (fig. 3, ref. 10; see arrow in the figure provided below for convenience) such that the depression is located in the second part (as provided by the light-shielding layer (23)) of the LC layer and the depression forms a step between the display region and non-display region (see arrow) and constitutes a buffer space for receiving extra liquid crystal (see circled area in figure below).



Fig. 3

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a depression like that of Murade formed on an inner surface of the first or second substrate of the Kijima reference such that the depression is located in the second part of the LC layer to form a step between the display region and non-display region since one would not only to create buffer space for receiving extra liquid crystal but also to provide a more flattened area for alignment so that the aperture area and the non-aperture area are made flush with each other for the purposes of enhancing design matters and achieving a greater degree of fineness and the optimal field (col. 15, line 51 – col. 16, line 28). Ultimately, the depression serves to a remarkably improved degree of freedom in design, making it simpler to conduct normally difficult manufacturing steps and reducing cost (col. 3, lines 31-67).

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5. As per claims 5, Kijima discloses the LCD device as recited above further comprising TFTs (fig. 8a, ref. 21) arranged on the first substrate in such a way as to be electrically connected to the respective pixels and a dielectric layer (fig. 8b, ref. 85) formed on the first substrate to cover the TFTs and the pixels, such that the dielectric layer is where the depression is formed

6. As to claim 21, Kijima discloses the LCD device as recited above having a dielectric overcoat layer (fig. 8b, ref. 33) on at least a portion of the second substrate (11), however, the reference fails to specifically disclose where at least a portion of the layer is selectively etched to remove portions of the dielectric overcoat layer and formed the depression.

Murade discloses an LCD device where a step includes depositing an dielectric overcoat layer and forming a resist pattern to form the depressions by a predetermined and selective etching (col. 6, lines 44-54).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to selectively etched to remove portions of the dielectric overcoat layer and formed the depression since one would be motivated not only by the photolithographic conventions of forming such a depression but to provide a more flattened area for alignment so that the aperture area and the non-aperture area are made flush with each other for the purposes of enhancing design matters and achieving a greater degree of fineness and the optimal field (col. 15, line 51 – col. 16, line 28). Ultimately, forming the depression in this way serves to a remarkably improved degree

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of freedom in design, making it simpler to conduct normally difficult manufacturing steps and reducing cost (col. 3, lines 31-67).

7. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kijima in view of Murade, and in further view of Miyazaki et al. (U.S. Patent No. 5,978,061, hereinafter "Miyazaki").

8. As to claim 6, Kijima, when modified by Murade, discloses the LCD device as recited above, however, the reference fails to specifically disclose a dielectric layer having a depression formed on the second substrate.

Miyazaki discloses an LCD device having a dielectric layer (fig. 1, ref. 35) having a depression formed on the second substrate.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a dielectric layer having a depression formed on the second substrate since one would be motivated to improve alignment and orientation, and ultimately to reduce display defect attributed to deterioration in cell gap (col. 3, lines 15-19).

9. As per claim 7, Kijima, when modified by Murade, discloses the LCD device as recited above, however, the reference fails to specifically disclose one of the first or second substrates having a transparent plate having a depressed part on its inner surface.

Miyazaki discloses an LCD device where the second substrate has a transparent plate (fig. 1, ref. 34) having a depressed part on its inner surface.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have one of the first or second substrates having a transparent plate having a depressed part on its inner surface since one would be motivated to provide electrode function as well as to reduce display defect attributed to deterioration in cell gap, increase yield, and provide optimum display performance (col. 3, lines 15-19).

10. Regarding claim 8, Kijima, when modified by Murade, discloses the LCD device as recited, however, the reference fails to specifically disclose the satisfaction of the expression, $H \geq (1/2) \times (1000 + L) \times [0.02d + [L \times (0.02d/1000)]/L]$ (T_m).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have satisfied the relationship, $H \geq (1/2) \times (1000 + L) \times [0.02d + [L \times (0.02d/1000)]/L]$ (T_m) is satisfied (col. 16, lines 17-46), since one would be motivated to suppress the level of non-uniformity due to variations in cell thickness to an acceptable level so that a convex/concave profile can be provided (col. 16, lines 17-47). Ultimately, this serves to help realize a uniform cell thickness across the entire panel and improve display quality (col. 5, lines 7-29).

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11. As to claim 9, Kijima, when modified by Murade, discloses the LCD device as recited above, however, the reference fails to specifically disclose spacers that are pole-shaped formed on one of the first and second substrates.

Miyazaki discloses an LCD device having spacers that are pole-shaped (fig. 1, ref. 33) formed on one of the first and second substrates.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have spacers that are pole-shaped formed on one of the first and second substrates since one would be motivated to minimize rubbing cloth during the rubbing process so that an orientation defective area does not extend into the pixel area (abstract). Ultimately, this serves to reduce display defect attributed to deterioration in cell gap, increase yield, and provide optimum display performance (col. 3, lines 15-19).

Response to Arguments

12. Applicant's arguments with respect to claims 1 and 5-10 have been considered but are moot in view of the new ground(s) of rejection.

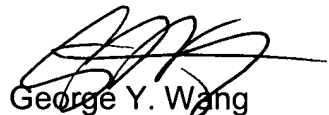
Applicant amends independent claim 1 to include the limitation of the depression formed in the substrate located within the second part of the LC layer for receiving extra LC as previously recited in dependent claim 4 (now cancelled). However, in light of the new grounds of rejection to include new reference Murade, Applicant's arguments with regard to reference not teaching a depression are moot.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Y. Wang whose telephone number is 571-272-2304. The examiner can normally be reached on M-F, 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


George Y. Wang
Examiner
Art Unit 2871

December 27, 2005